

2003 Energy *An Energy-Efficiency Workshop and Exposition*
Orlando, Florida

*Energy Security Through Distributed Generation at the
Great Lakes Naval Service Training Center*

Peter Behrens
U.S. Navy

2003 Energy *Great Lakes*

- Navy's only "Boot Camp"
- Urban Campus Environment
 - Student Population of 35,000
 - 1700 Acres
 - 240+ Institutional buildings
- Facilities Team Midwest is the Utility Provider on the campus



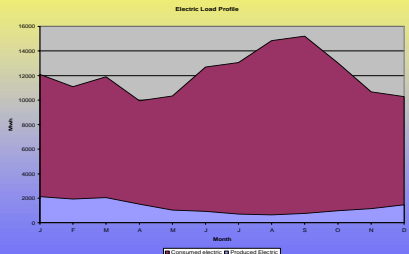
August 17-20, 2003 www.energy2003.ee.doe.gov 2

2003 Energy *Existing Conditions - Electric*

- 31 Mw peak demand, 150,000 Mhr/yr
- Purchase 91%
 - COMED Discounted Rate 6L
- Produce 9%
 - 2 1500 Kw Back pressure steam turbines
 - Thermal following mode

August 17-20, 2003 www.energy2003.ee.doe.gov 3

2003 Energy *Existing Electric Load Profile*



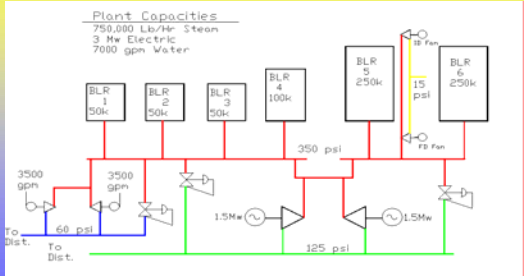
August 17-20, 2003 www.energy2003.ee.doe.gov 4

2003 Energy *Existing Conditions - Steam*

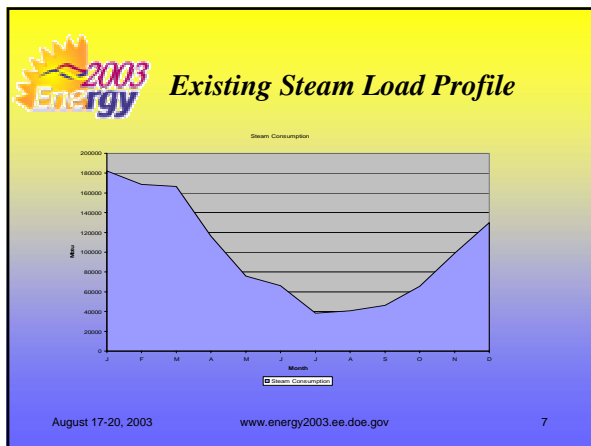
- Central Plant
 - 750,000 Lb/hr capacity
 - 370,000 lb/hr peak load
- Plant Equipment - Boilers
 - 3 50,000 lb/hr gas/oil 1941
 - 1 100,000 lb/hr gas/oil 1948
 - 2 250,000 lb/hr gas/oil 1965

August 17-20, 2003 www.energy2003.ee.doe.gov 5

2003 Energy *Existing Plant Layout*

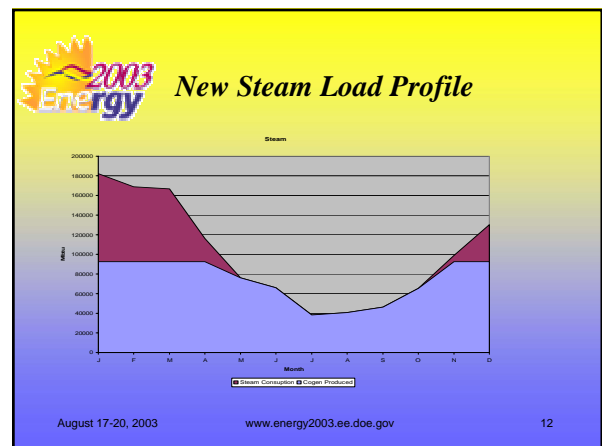
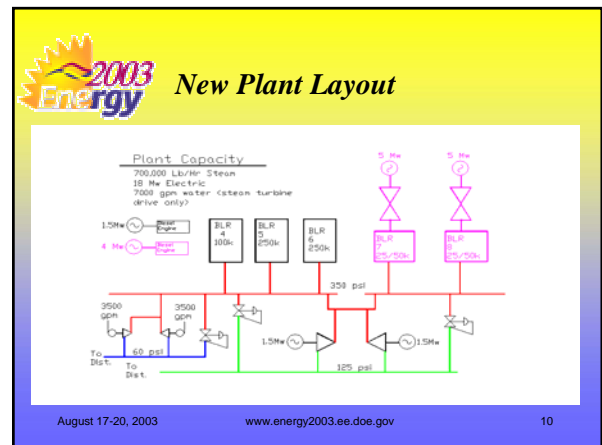


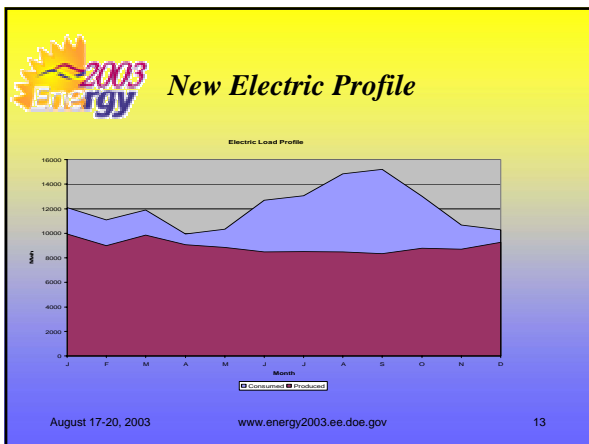
August 17-20, 2003 www.energy2003.ee.doe.gov 6



- 2003 Energy** *Energy Market/Projects*
- Illinois deregulated it's electric market in 1999
 - Great Lakes Discounted Electric Rate expires 2006
 - 1995 UESC w/COMED (Exelon Federal Services) for work in the buildings
 - 2002 Audit of plant and distribution systems
 - Recommended condensate line replacement
 - Fuel oil Conversion
 - 2-5Mw Gas Turbine/Heat Recovery Steam Generators
- August 17-20, 2003 www.energy2003.ee.doe.gov 8

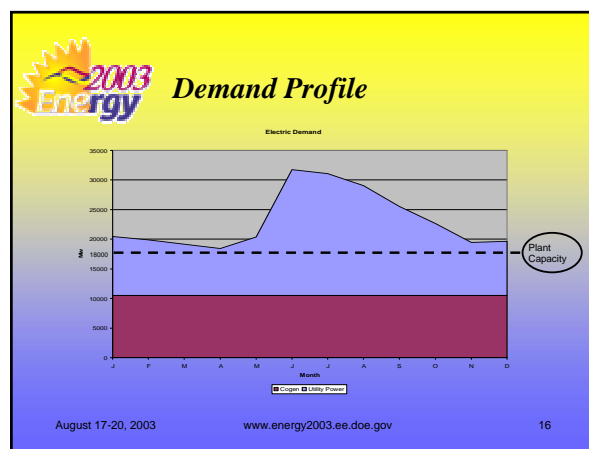
- 2003 Energy** *UESC Project*
- Exelon proposal
 - Replace 6300 lf of condensate piping
 - Convert existing boiler draft fans to VFD's
 - Convert existing #6 oil system to #2 oil
 - Replace existing 50 Kpph boilers with 2 5Mw GT/HRSG's
- August 17-20, 2003 www.energy2003.ee.doe.gov 9





-
- Project capital cost \$35M
 - Financed through UESC
 - Simple payback 10 yrs
 - 15 year financing term
 - \$3.4M/yr payment
 - \$3.5M/yr savings
- August 17-20, 2003 www.energy2003.ee.doe.gov 14

-
- Existing system dependent on Utility power
 - Power plant only capable of keeping the core utility plant in power
 - New Plant
 - Capable of generating over 50% of the facilities requirement
 - Capable of keeping the Navy's core mission operating in Island mode with on site fuel source
- August 17-20, 2003 www.energy2003.ee.doe.gov 15



August 17-20, 2003 www.energy2003.ee.doe.gov 17

August 17-20, 2003 www.energy2003.ee.doe.gov 18